

Listing of all claims per revised 37 CFR §1.121

1-20. (cancelled)

21. (currently amended) A sensor for measuring a vector component of heat flux comprising: a thin flat substrate plate of thermally conducting, electrically insulating material; a thin film thermopile consisting of hot and cold junctions connected by conductors, deposited on a surface of said substrate plate; ~~with the axis of said thermopile aligned with said vector~~; and electrical connections on said thin film thermopile for measuring its voltage; wherein said thermopile has maximum sensitivity to heat flux in the plane of said substrate and on an axis of said thermopile parallel to conductors connecting said hot and cold junctions; and wherein said thermopile is insensitive to heat flux orthogonal to the plane of said substrate.

22. The sensor of Claim 21 further comprising a thin flat cover plate of thermally conducting, electrically insulating material covering said thermopile on said substrate plate.

23. The sensor of claim 22 further comprising a solid body; and means for holding together and imbedding said substrate plate and said cover plate within said solid body.

24. The sensor of claim 23 in which said means for holding together and imbedding said substrate plate and said cover plate within said solid body comprises a threaded plug having a slot for holding said substrate plate and said cover plate together.

25. The sensor of claim 23 in which said means for holding together and imbedding said substrate plate and said cover plate within said solid body comprises a cylindrical plug having a slot for holding said substrate plate and said cover plate together.

26. The sensor of claim 24 in which said slot is formed in the side of said plug.

27. The sensor of claim 25 in which said slot is formed in the side of said plug.

28. (currently amended) The sensor of claim 24 in which said slot is formed in ~~the~~ an end of said plug.

29. (currently amended) The sensor of claim 25 in which said slot is formed in ~~the~~ an end of said plug.

30. The sensor of claim 23 in which the materials of said substrate plate and said cover plate have thermal properties closely matching those of said solid body.

31. The sensor of claim 23 in which the material of said substrate plate and said cover plate is aluminum nitride.

32. The sensor of claim 23 in which said substrate plate and said cover plate are made of metal

having a thin coating of electrical insulating material over at least a part of their surfaces.

33.(currently amended) A sensor for measuring heat flux ~~along an axis~~ within a solid body comprising:

a thin flat substrate plate of thermally conducting, electrically insulating material;

a thin film thermopile consisting of hot and cold junctions connected by conductors deposited on a surface of said substrate plate ~~with hot and cold junction pairs of said thermopile and aligned with said axis;~~

electrical connections on said thin film thermopile for measuring its voltage; and

means for imbedding said substrate plate within said solid body; wherein said thermopile has maximum sensitivity to heat flux in the plane of said substrate and on an axis of said thermopile parallel to lines connecting said hot and cold junctions, and wherein said thermopile is insensitive to heat flux orthogonal to the plane of said substrate.

34. The sensor of claim 33 further comprising a cover plate of thermally conducting, electrically insulating material for covering said thermopile on said substrate plate.

35. The sensor of claim 34 in which said means for imbedding said substrate plate within said body comprise:

a threaded plug having a slot for holding said substrate plate; and

a threaded hole in said solid body.

36. The sensor of claim 34 in which said means for imbedding said substrate plate within said body comprise:

a cylindrical plug having a slot for holding said substrate plate; and

a hole in said solid body with diameter suitable for a press fit of said plug into said hole in said solid body.

37. (currently amended) The sensor of claim 35 in which said slot is formed in ~~the~~ an end of said plug.

38. (currently amended) The sensor of claim 36 in which said slot is formed in ~~the~~ an end of said plug.

39. The sensor of claim 35 in which said slot is formed in the side of said plug.

40. The sensor of claim 36 in which said slot is formed in the side of said plug.

41. The sensor of claim 33 in which the material of said substrate plate has thermal properties closely matching those of said solid body.

42. The sensor of claim 34 in which the materials of said substrate plate and said cover plate have thermal properties closely matching those of said solid body.